PBL Process & Tools - MMIS

E. Poitras

Copyright © 2003 Raytheon Company
All rights reserved

Agenda

- MMIS Overview
  - General Description
  - Concept of Operation
  - Planned Approach
  - Sample Data Screens
  - Automated Information Technology
  - Integration with Organic System (WEB-CAV's)

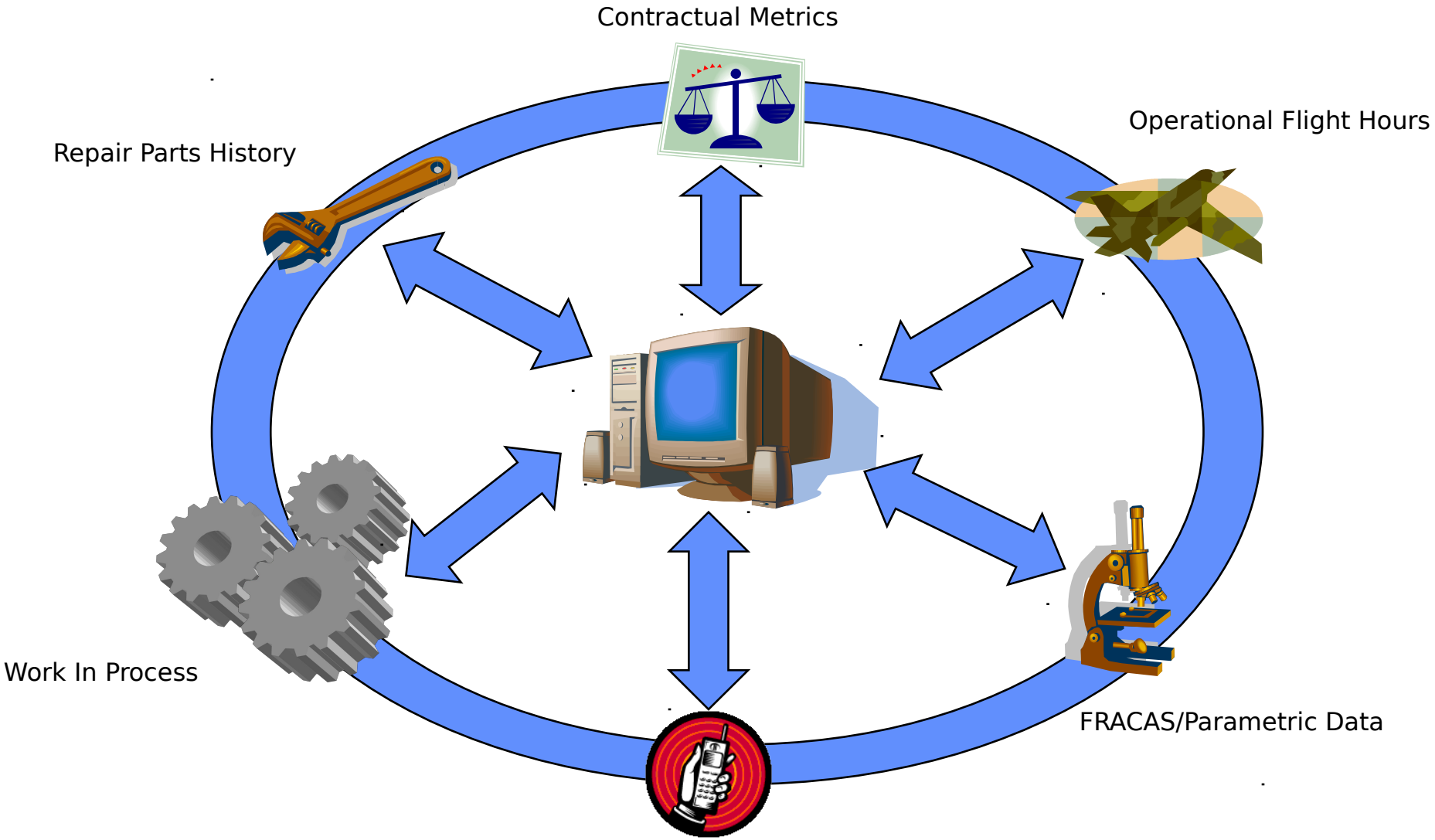
Copyright © 2003 Raytheon Company
All rights reserved

What it Does

- Provides On-Line status and history to authorized users for virtually all program data.
  - Data maintained on-line by users
  - Reports built on demand from current data
  - Access to data limited by username and password
  - Data available via Internet at virtually any location
  - Links provide access to data supported by other web-sites
  - Integrated with Government Electronic Data Interchange systems
  - Allows segregation of data between project and programs
  - Data access and privileges tailored using roles and usernames

Copyright © 2003 Raytheon Company
All rights reserved

MMIS Provides Integrated Management Information for PBL's



Copyright © 2003 Raytheon Company
All rights reserved

Concept of Operation

- All Program Data Stored in an Commonly Accessible Multi-user Database
- Access Controlled by Userid’s and Passwords
- Data Entered and Retrieved over the Internet
- Reports Generated from Live Data on Demand
- Hardware Identified Internally Using Contact Memory Buttons

Copyright © 2003 Raytheon Company
All rights reserved

Planned Approach

- Thin client Web based JAVA application. Client PC only requires Internet Explorer or Netscape
- Data is stored in an Oracle Database
- Access through Web application or client/server application
- The MMIS will tie together the existing data sources into a single location for reporting, and searching

Copyright © 2003 Raytheon Company
All rights reserved

What kinds of data are supported

- As-Built and As-Maintained configuration status accounting
  - As-Built History - Shows top down breakdown by assembly
    - Allows searching by assembly or specific part number
    - Data is imported from PQRS or entered on-line
  - Tracks changes to As-Built configurations (As-Maintained) during troubleshooting and repair
    - Integrated with work flow traveler and FRACAS systems
    - Updates performed as information develops
- Inventory Status
  - Integrated with FRACAS and EDI Requisition processes
  - Supports CAV reporting via EDI
- FRACAS
  - Tracks defects and part removals
  - Identifies corrective action and trends
  - Integrated with ABC/AMC

Copyright © 2003 Raytheon Company
All rights reserved

More Data Types

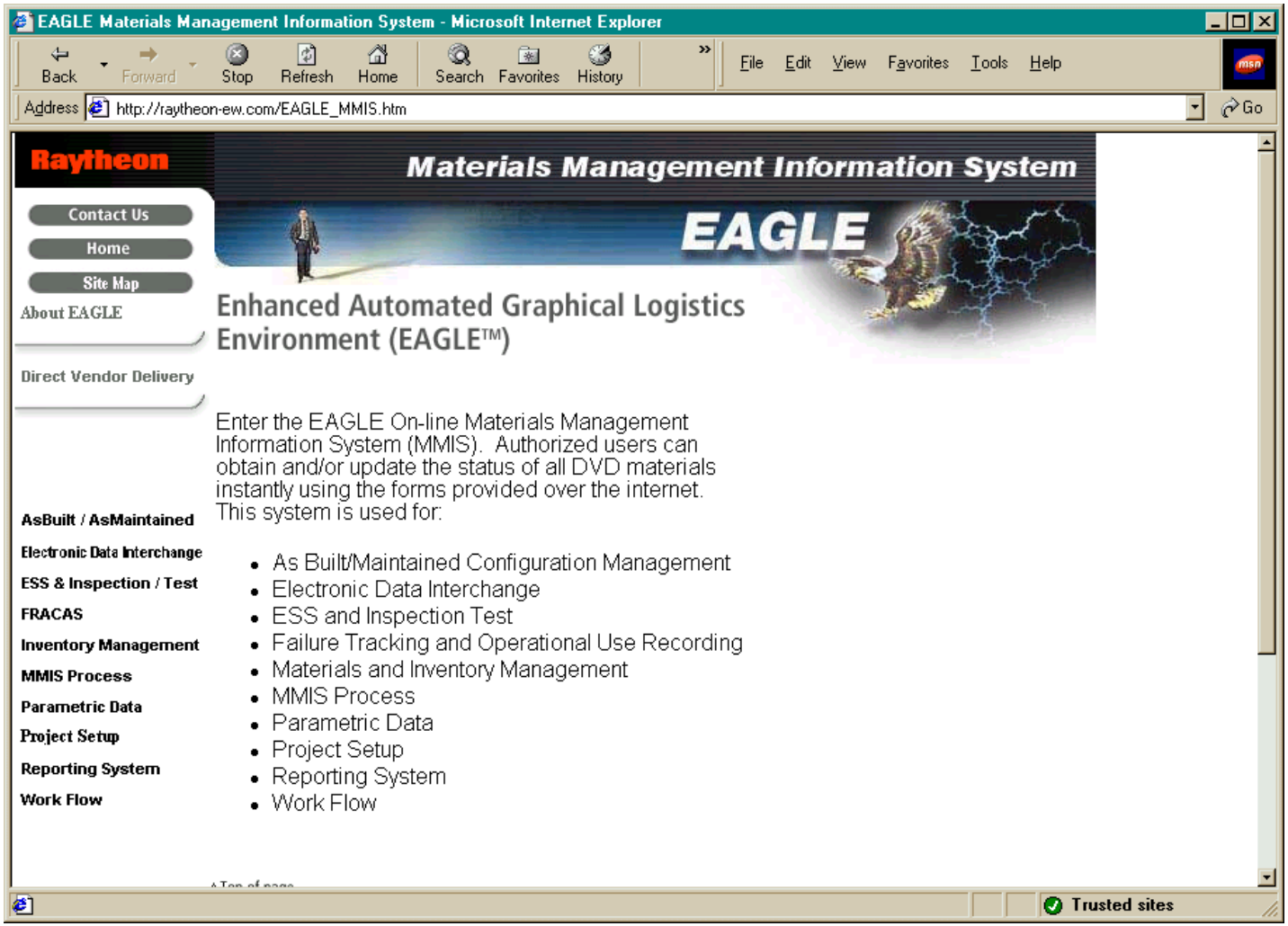
- Parametric Test Data
  - Records actual measured values and BIT test results for each test of each WRA
    - Allows users to attach “Raw” Data files to facilitate off-site review
  - Integrated with Work Flow and FRACAS
  - Allows trend analysis over time, SN Range History Etc.
- Work Flow Tracking and Status
  - Provides real time planning and status for each induction as it is received, tested troubleshot and repaired
  - Integrated with other activities
    - As-Built/As-Maintained Configuration Management
    - FRACAS
    - Inventory Status
    - Government Requisition placement and tracking
    - Government CAV reporting
  - Allows work flow to be tailored as testing/troubleshooting progresses
  - Work flow status can be tracked on-line

Copyright © 2003 Raytheon Company
All rights reserved

- Methods Linked to Work Flow
  - Methods stored on internal servers not accessible to users outside of Raytheon
  - Links built during traveler creation/planning
- Engineering Documents tracked and stored on-line
  - ECO's
  - IR/ECRA's
  - Deviation/Waivers
  - Program Directives
  - Action Items
- Program Documents Uploaded and stored on-line - Access controlled by User Accounts
  - DVD Review Board Minutes
  - Supports Document Storage and Retrieval In Native Formats

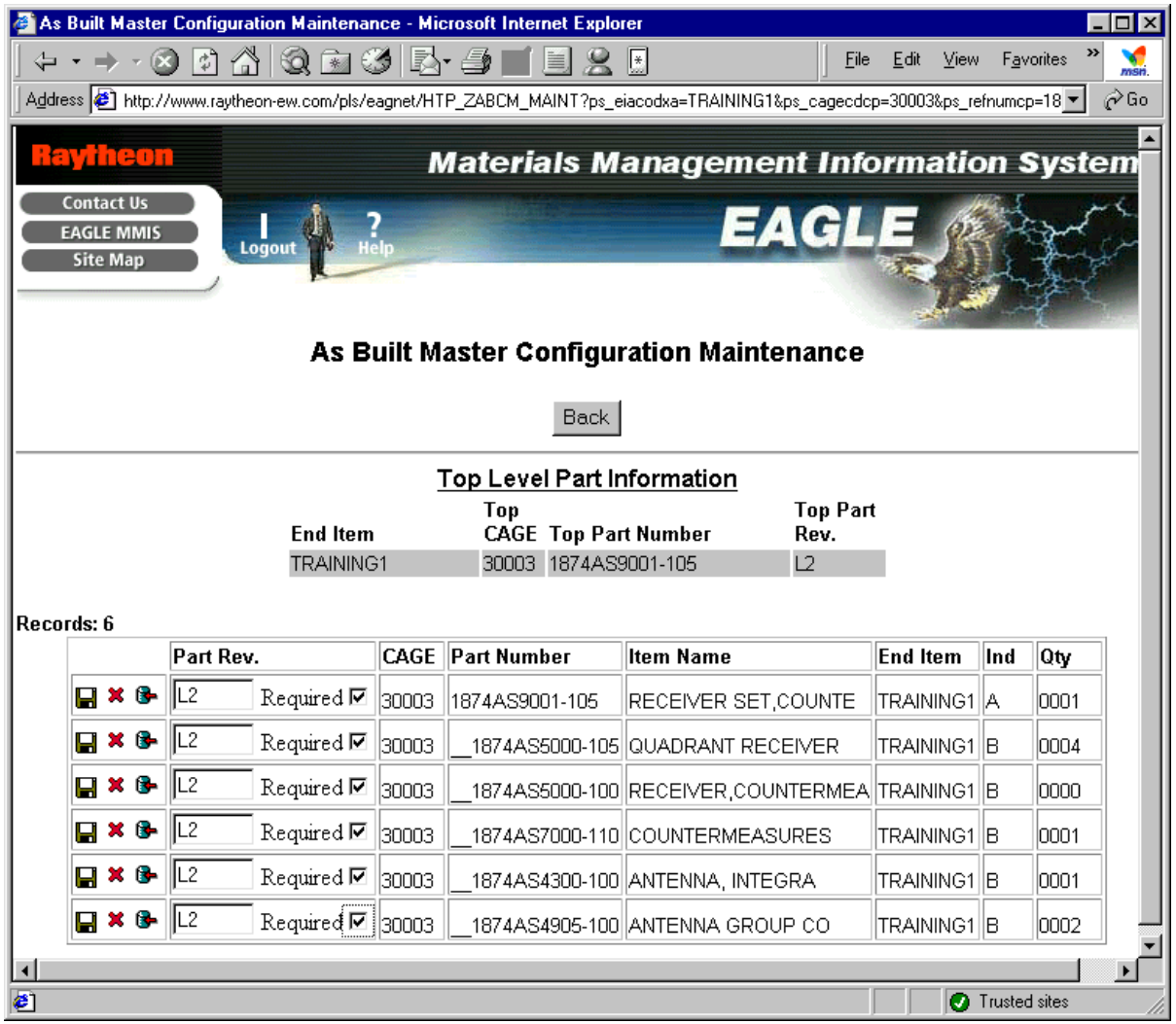
Copyright © 2003 Raytheon Company
All rights reserved

EAGLE MMIS Page



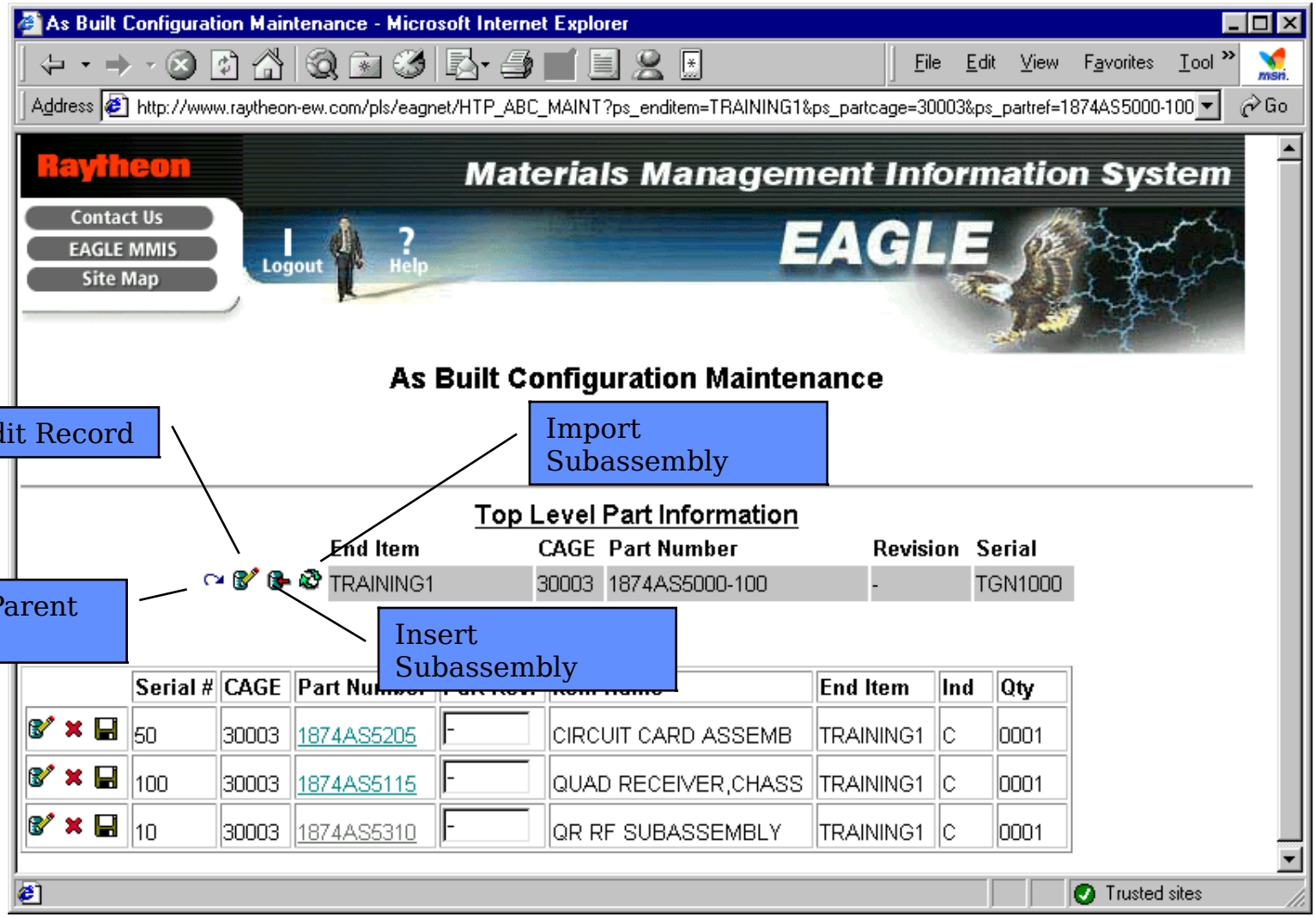
Copyright © 2003 Raytheon Company
All rights reserved

As Built Master Screen



Copyright © 2003 Raytheon Company
All rights reserved

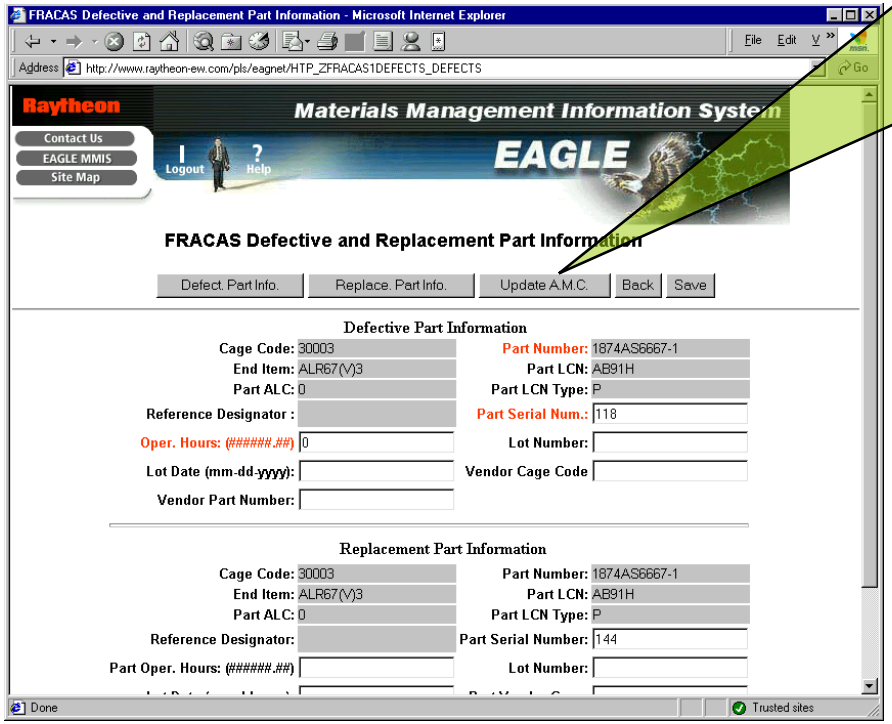
Assembly Level ABC Screen

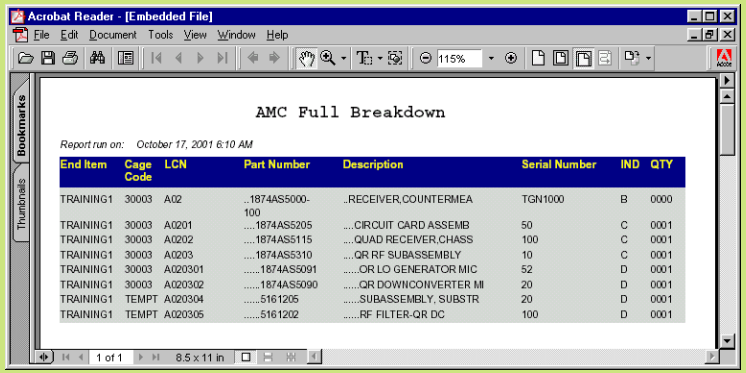


Copyright © 2003 Raytheon Company
All rights reserved

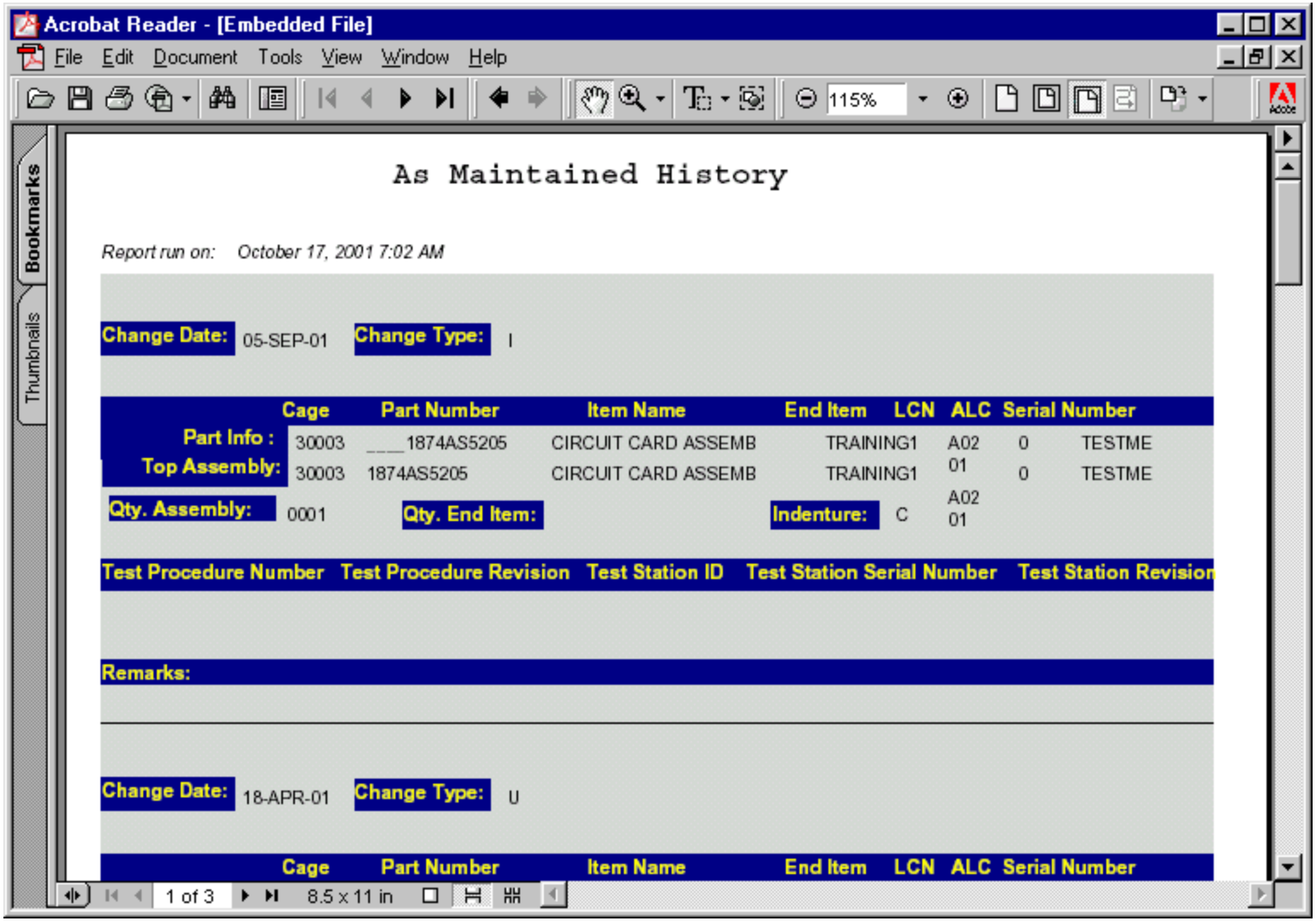
AMC Linked to FRACAS Process

- AMC Updated as Failed Parts are Removed
- Extendable to Any Level of Assembly




Acrobat Reader - [Embedded File]
File Edit Document Tools View Window Help
Bookmarks
Thumbnails
AMC Full Breakdown
Report run on: October 17, 2001 6:10 AM
End Item | Cage Code | LCN | Part Number | Description | Serial Number | IND | QTY
TRAINING1 30003 A02 ..1874AS5000-100 ..RECEIVER,COUNTERMEA TGN1000 B 0000
TRAINING1 30003 A0201 ....1874AS5205 ....CIRCUIT CARD ASSEMB 50 C 0001
TRAINING1 30003 A0202 ....1874AS5115 ....QUAD RECEIVER,CHASS 100 C 0001
TRAINING1 30003 A0203 ....1874AS5310 ....QR RF SUBASSEMBLY 10 C 0001
TRAINING1 30003 A020301 ......1874AS5091 ......OR LO GENERATOR MIC 52 D 0001
TRAINING1 30003 A020302 ......1874AS5090 ......QR DOWNCONVERTER MI 20 D 0001
TRAINING1 TEMPT A020304 ......5161205 ......SUBASSEMBLY, SUBSTR 20 D 0001
TRAINING1 TEMPT A020305 ......5161202 ......RF FILTER-QR DC 100 D 0001
1 of 1
8.5 x 11 in

Copyright © 2003 Raytheon Company
All rights reserved


Acrobat Reader - [Embedded File]
File Edit Document Tools View Window Help
115%
Bookmarks
Thumbnails
As Maintained History
Report run on: October 17, 2001 7:02 AM
Change Date: 05-SEP-01
Change Type: I
Cage Part Number Item Name End Item LCN ALC Serial Number
Part Info : 30003 ___1874AS5205 CIRCUIT CARD ASSEMB TRAINING1 A02 0 TESTME
Top Assembly: 30003 1874AS5205 CIRCUIT CARD ASSEMB TRAINING1 01 0 TESTME
Qty. Assembly: 0001
Qty. End Item:
Indenture: C A02 01
Test Procedure Number Test Procedure Revision Test Station ID Test Station Serial Number Test Station Revision
Remarks:
Change Date: 18-APR-01
Change Type: U
Cage Part Number Item Name End Item LCN ALC Serial Number
1 of 3
8.5 x 11 in

Copyright © 2003 Raytheon Company
All rights reserved

User Reports

- All Program Data is accessed on-line via MMIS
  - FRACAS
  - Inventory
  - Material In Transit
  - Program Metrics
  - Workflow
- Data accessible from a variety of devices
  - PC Browser
  - Personal Data Assistant (PDA)
  - Web Enabled Cell Phone

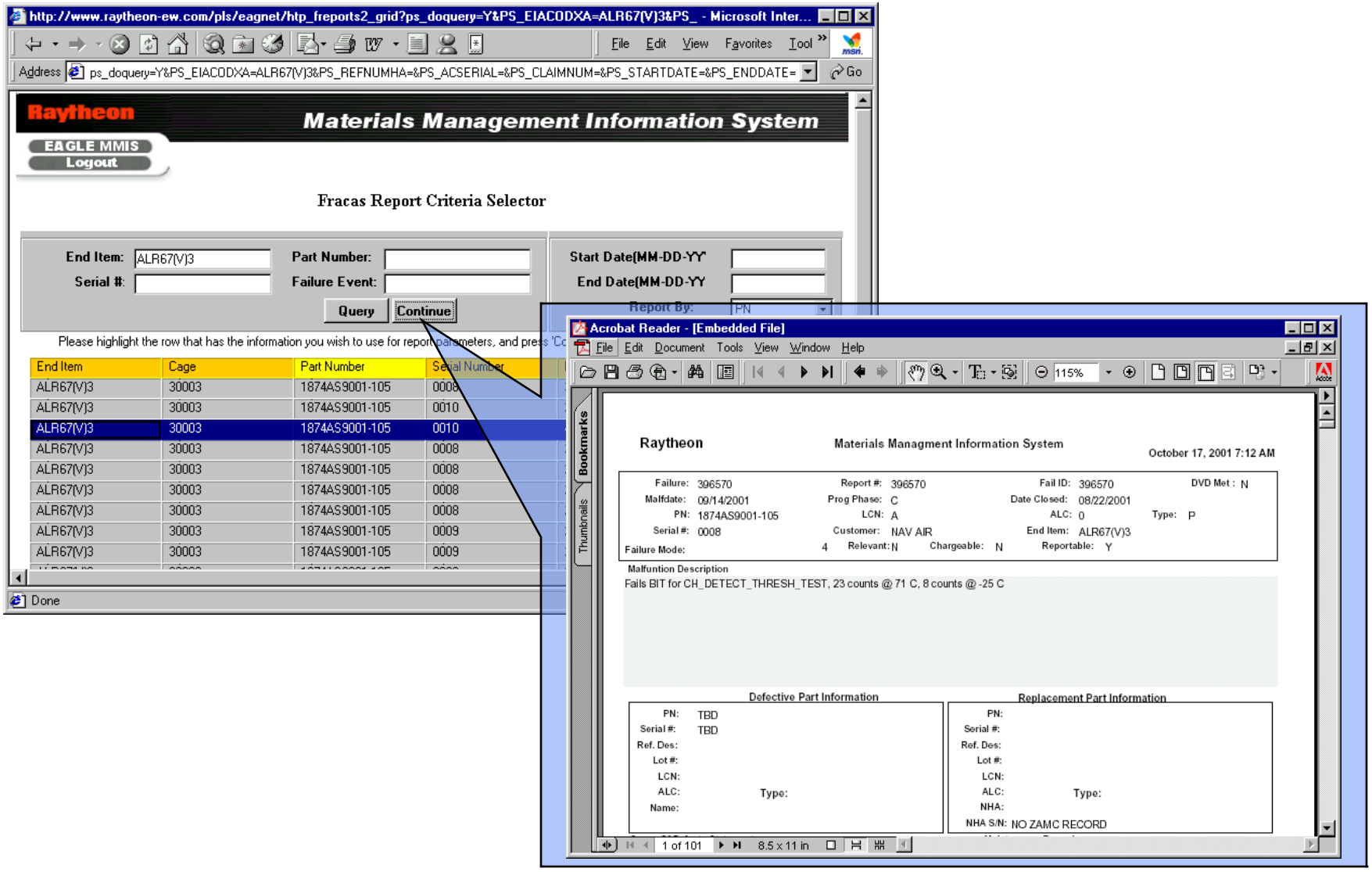
Copyright © 2003 Raytheon Company
All rights reserved

FRACAS Reports

- FRACAS Defect Reports - Generate FRACAS reports by part number,serial number, or failure event I.D.
- Open FRACAS Defects - Generate FRACAS report that lists all open defect investigations.
- FRACAS Trend Analysis Report (w/TBD) - Reports defective part statistics that includes TBD defects in calculations.
- FRACAS Trend Analysis Report (No TBD) - Reports defective part statistics that does not include TBD defects in calculations.
- MFHBF Report - Reports Mean Time Between Failures.

Copyright © 2003 Raytheon Company
All rights reserved

FRACAS (Open) Defects Report



Copyright © 2003 Raytheon Company
All rights reserved

FRACAS Trend Analysis Report

Acrobat Reader - [Embedded File]

File Edit Document Tools View Window Help

Raytheon Materials Management Information System

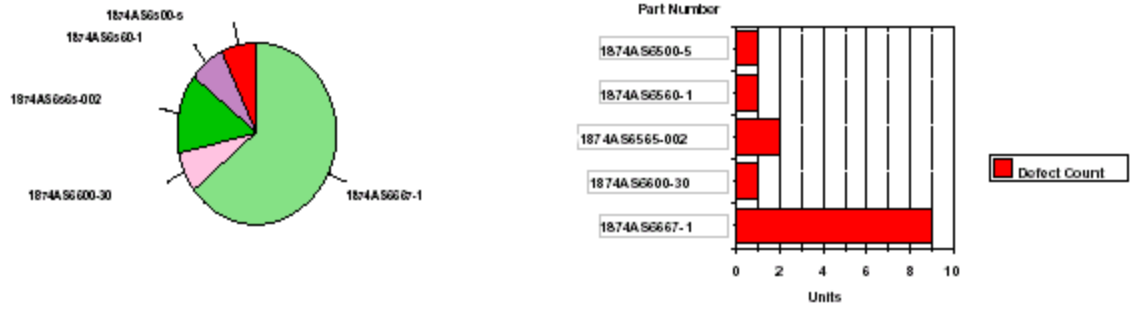
FRACAS TREND REPORT

Report run on:October 17, 2001 7:19 AM

End Item: ALR67(V)3 PN: 1874AS6000-105

Name: CR

Part Number	Defective Part Name	Defects	%
1874AS6500-5	RF ELECTRONICS MODU	1	3.84615384615385
1874AS6560-1	RF DISTRIBUTION ASS	1	3.84615384615385
1874AS6565-002	SUPERHET LO DOWNCON	2	7.69230769230769
1874AS6600-30	ASSEMBLY, CHANNELIZ	1	3.84615384615385
1874AS6667-1	CUED RECEIVER MICRO	9	34.6153846153846

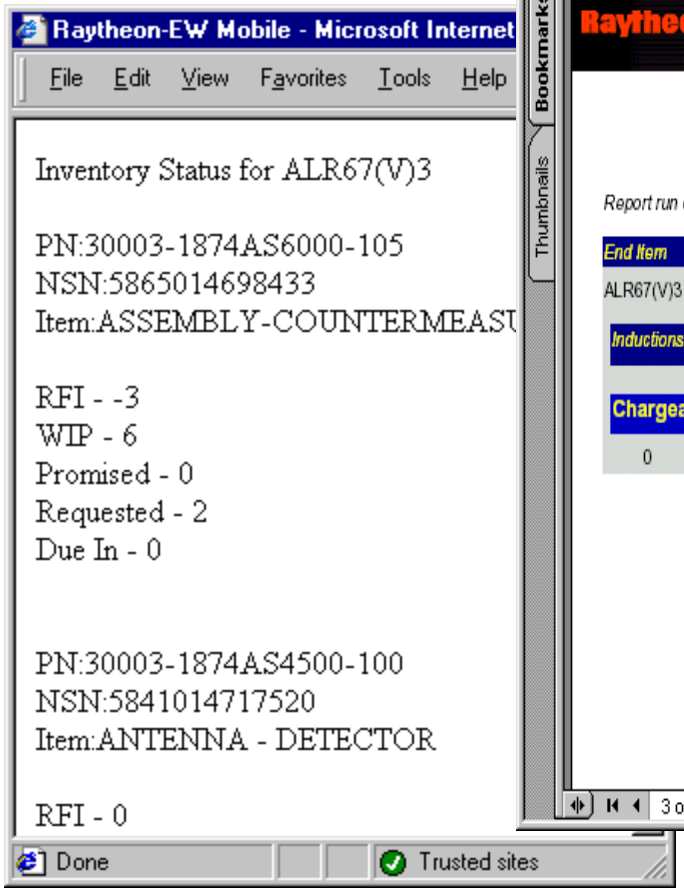


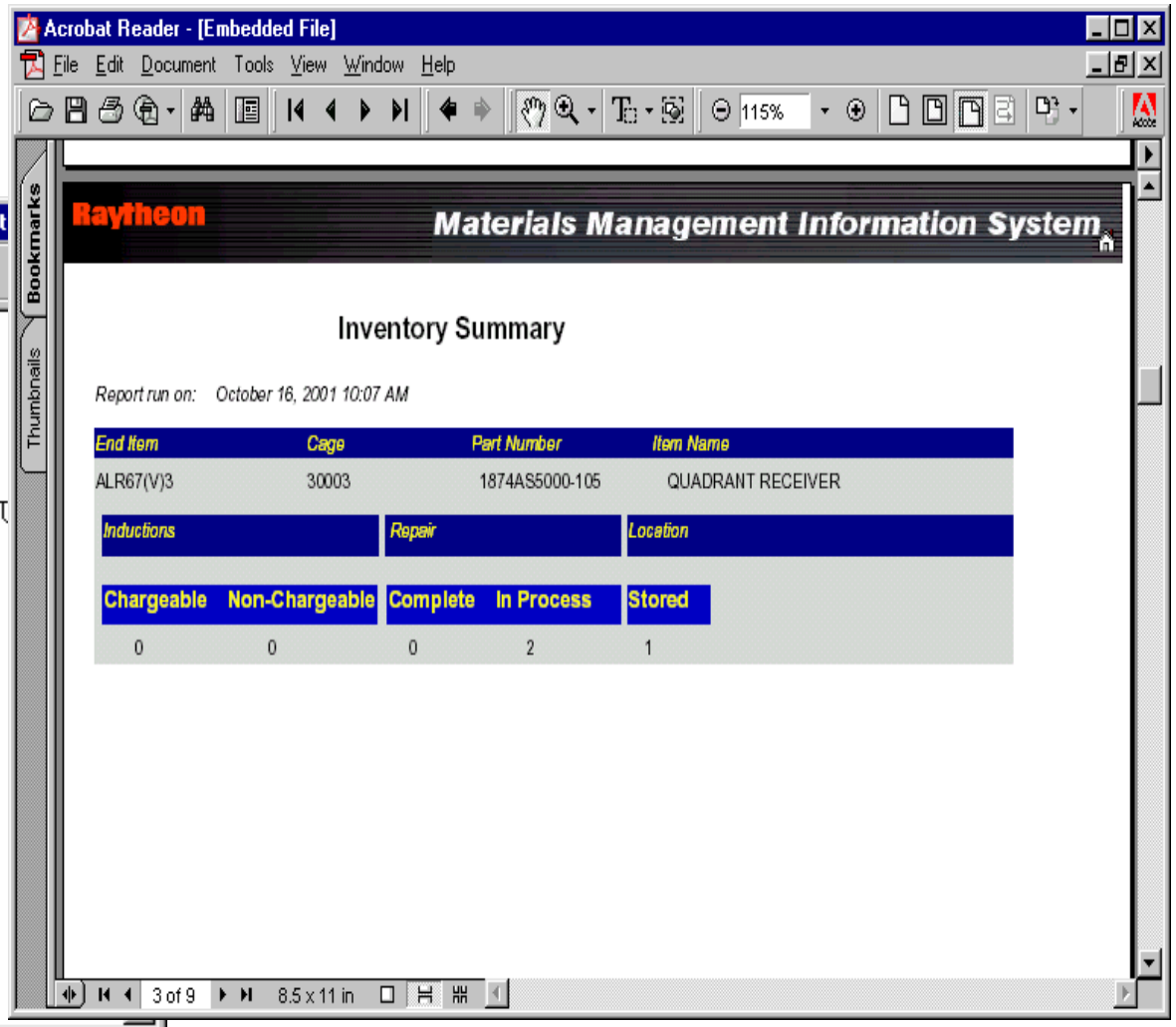
7 of 11 8.5 x 11 in

Copyright © 2003 Raytheon Company
All rights reserved

Inventory

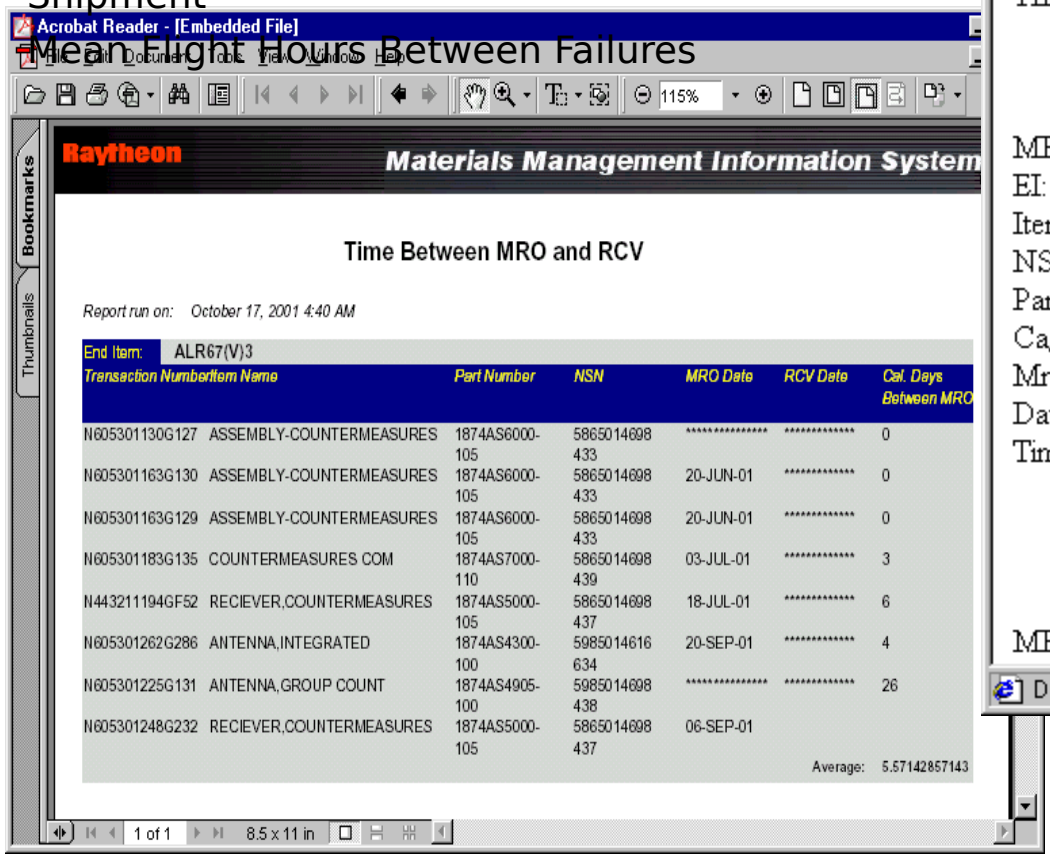
- Inventory Status Search
- Inventory Summary

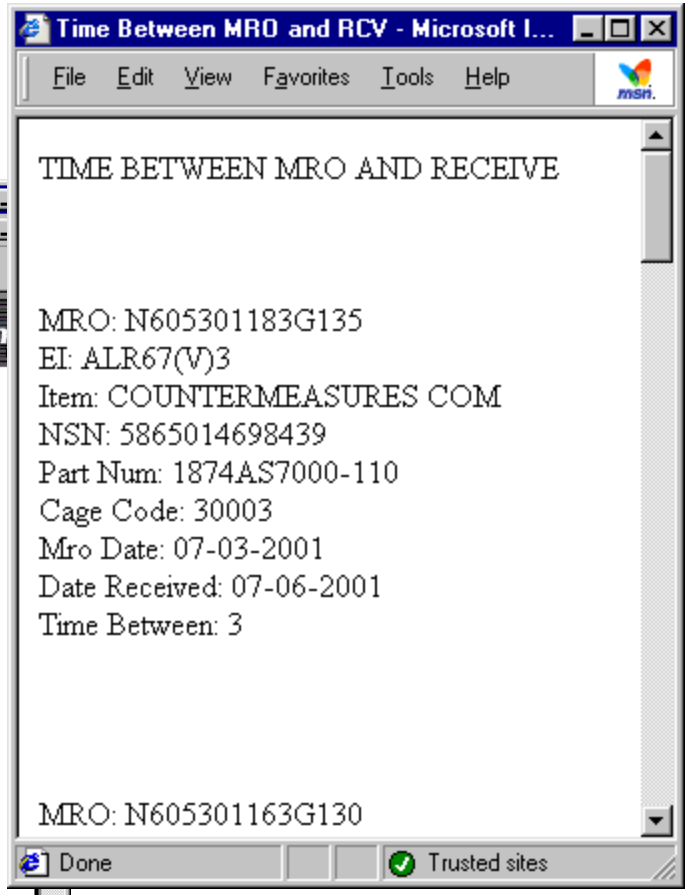




Copyright © 2003 Raytheon Company
All rights reserved

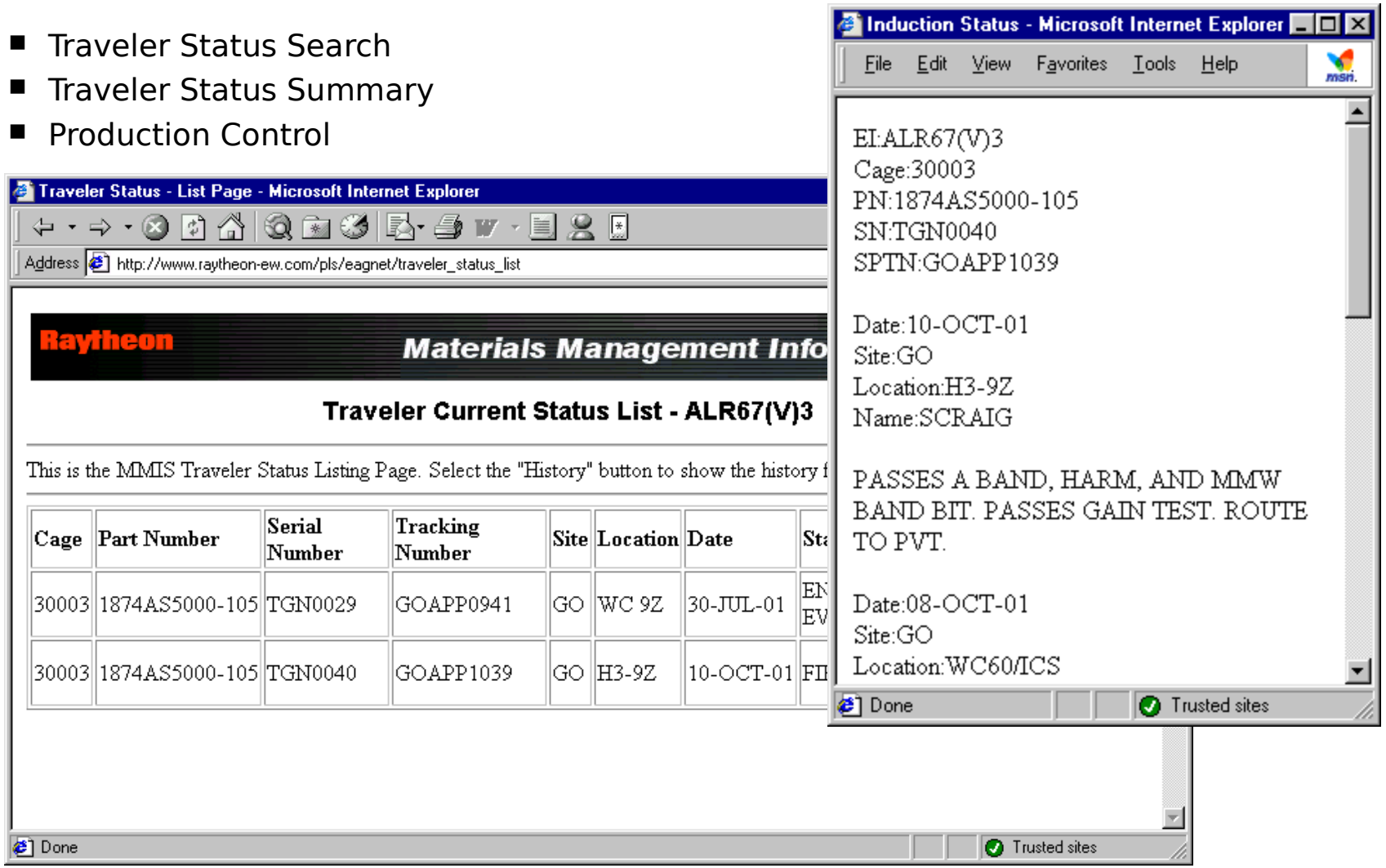
- Time Between Item Request and Induction
- Time Between Item Request and Shipment
- Mean Flight Hours Between Failures


Acrobat Reader - [Embedded File]
Raytheon
Materials Management Information System
Time Between MRO and RCV
Report run on: October 17, 2001 4:40 AM
End Item: ALR67(V)3
Transaction Number Item Name Part Number NSN MRO Date RCV Date Cal. Days Between MRO
N605301130G127 ASSEMBLY-COUNTERMEASURES 1874AS6000-105 5865014698433 0
N605301163G130 ASSEMBLY-COUNTERMEASURES 1874AS6000-105 5865014698433 20-JUN-01 0
N605301163G129 ASSEMBLY-COUNTERMEASURES 1874AS6000-105 5865014698433 20-JUN-01 0
N605301183G135 COUNTERMEASURES COM 1874AS7000-110 5865014698439 03-JUL-01 3
N443211194GF52 RECIEVER,COUNTERMEASURES 1874AS5000-105 5865014698437 18-JUL-01 6
N605301262G286 ANTENNA,INTEGRATED 1874AS4300-100 5985014616634 20-SEP-01 4
N605301225G131 ANTENNA,GROUP COUNT 1874AS4905-100 5985014698438 26
N605301248G232 RECIEVER,COUNTERMEASURES 1874AS5000-105 5865014698437 06-SEP-01
Average: 5.57142857143
1 of 1
8.5 x 11 in



Copyright © 2003 Raytheon Company
All rights reserved

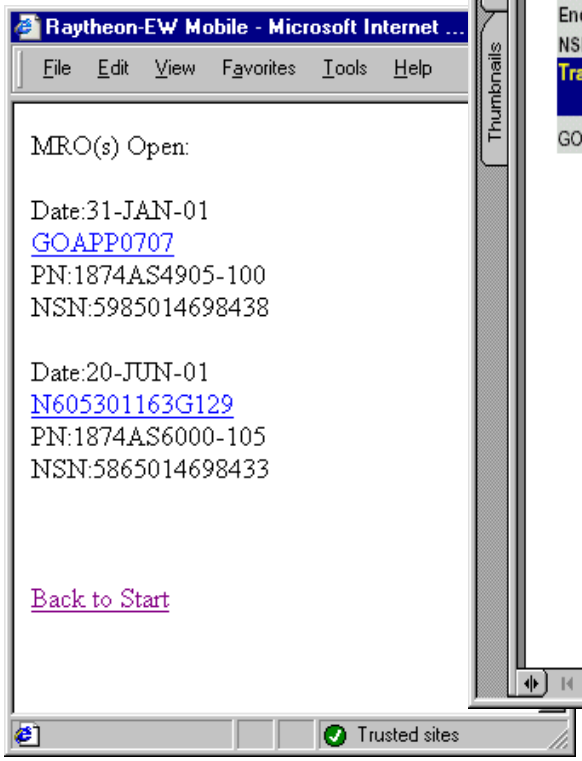
- Traveler Status Search
- Traveler Status Summary
- Production Control

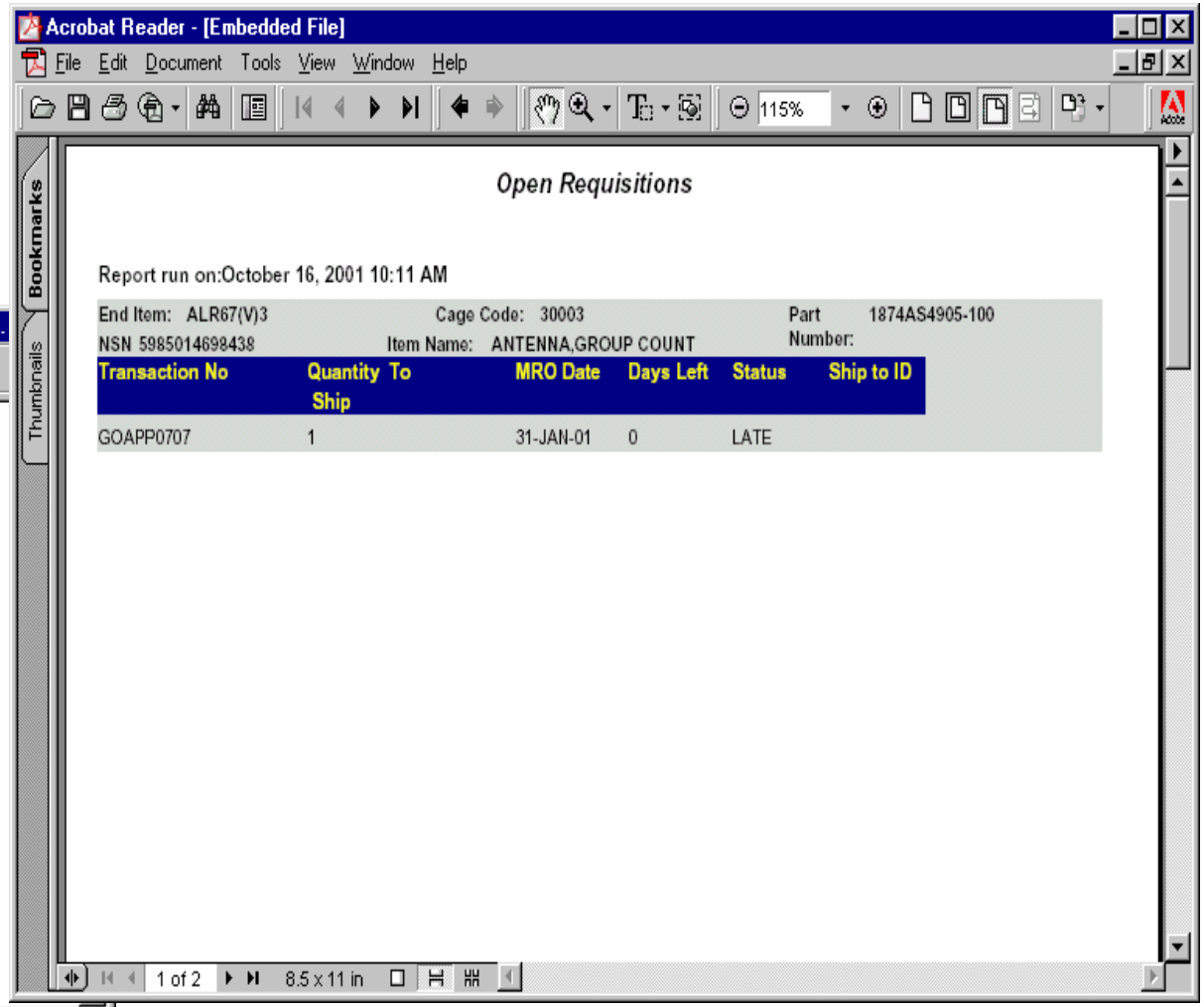

Induction Status - Microsoft Internet Explorer
File Edit View Favorites Tools Help
EI:ALR67(V)3
Cage:30003
PN:1874AS5000-105
SN:TGN0040
SPTN:GOAPP1039
Date:10-OCT-01
Site:GO
Location:H3-9Z
Name:SCRAIG
PASSES A BAND, HARM, AND MMW BAND BIT. PASSES GAIN TEST. ROUTE TO PVT.
Date:08-OCT-01
Site:GO
Location:WC60/ICS
Done
Trusted sites
Traveler Status - List Page - Microsoft Internet Explorer
Address http://www.raytheon-ew.com/pls/eagnet/traveler_status_list
Raytheon
Materials Management Info
Traveler Current Status List - ALR67(V)3
This is the MMIS Traveler Status Listing Page. Select the "History" button to show the history f
Cage | Part Number | Serial Number | Tracking Number | Site | Location | Date | Sta
30003 | 1874AS5000-105 | TGN0029 | GOAPP0941 | GO | WC 9Z | 30-JUL-01 | EN EV
30003 | 1874AS5000-105 | TGN0040 | GOAPP1039 | GO | H3-9Z | 10-OCT-01 | FI
Done
Trusted sites

Copyright © 2003 Raytheon Company
All rights reserved

Material In Transit

- ASSET Status
- MRO History
- Open Requisitions
- Units Due In

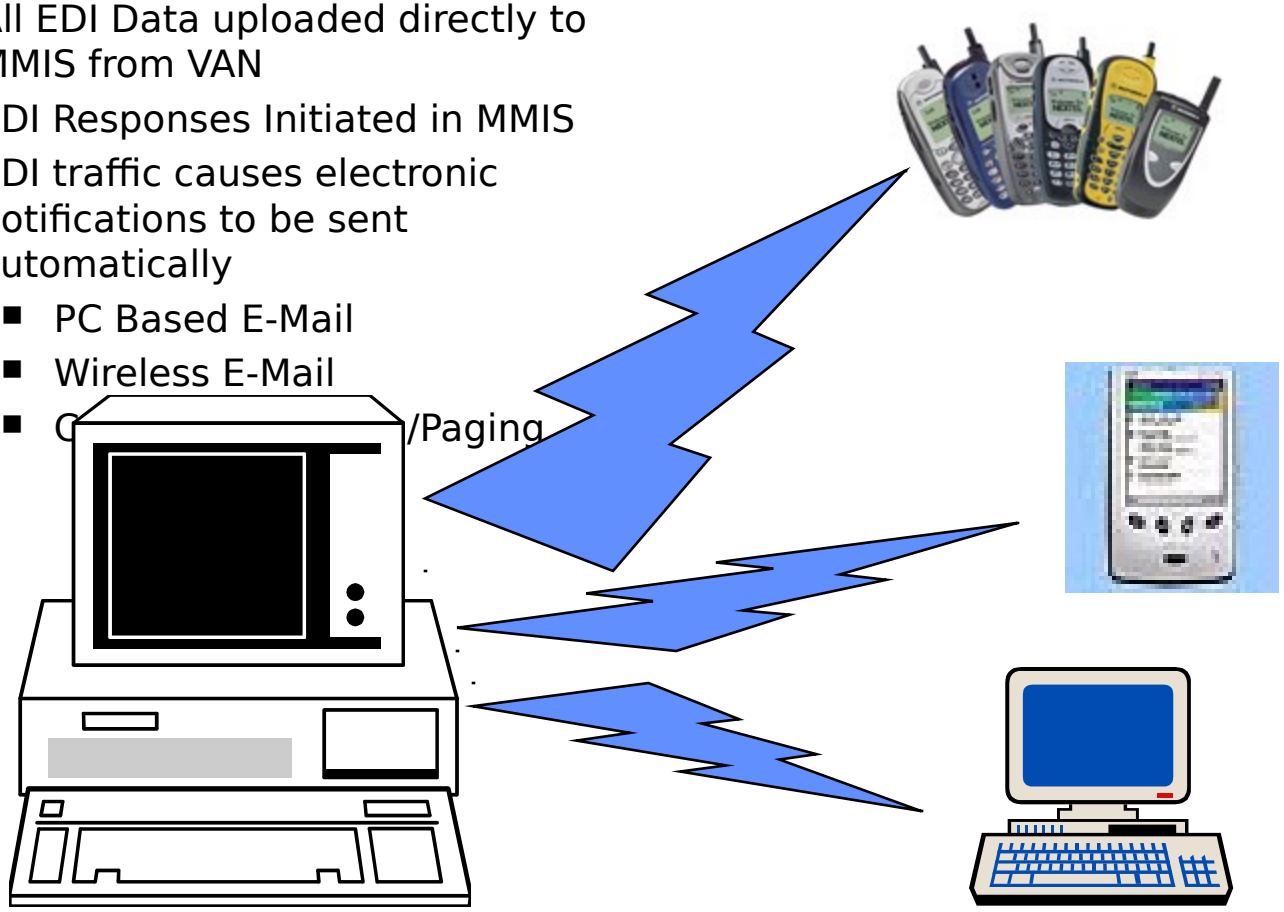




Copyright © 2003 Raytheon Company
All rights reserved

Wireless Notification

- EDI Services have been integrated with MMIS
  - — All EDI Data uploaded directly to MMIS from VAN
  - — EDI Responses Initiated in MMIS
  - — EDI traffic causes electronic notifications to be sent automatically
    - PC Based E-Mail
    - Wireless E-Mail
    - C /Paging

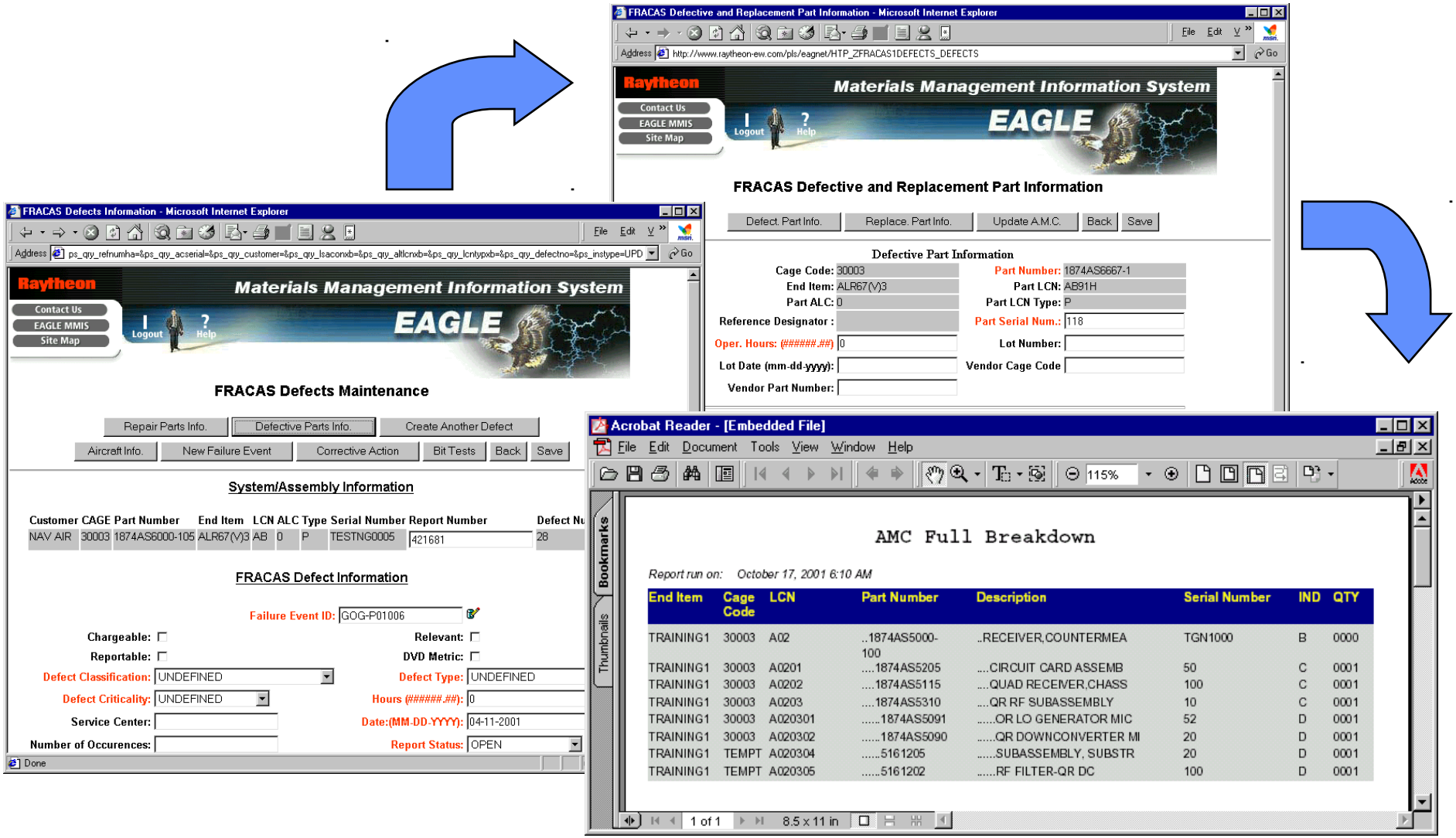


Copyright © 2003 Raytheon Company
All rights reserved

Material Management Information System

MMIS Demonstration
Automated Updates to AMC

Space & Airborne Systems
Electronic Warfare Systems



Copyright © 2003 Raytheon Company
All rights reserved

Maintain Part Locations - Microsoft Internet Explorer

Back Forward Stop Refresh Home Search Favorites History File Edit View Favorites Tools Help

Address http://raytheon-ew.com/eagle/HTP_BITMATRIX_MAINT Go

Raytheon **Materials Management Information System**

Bit Matrix Maintenance

Back Save

	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
BITPAGE 3	Spare	Spare	PM1 EE check sum	Spare	PM1 points memory	PM1 PDW FIFO	Spare	PM1 BI DMA	PM1 interupts	PM1 AC Bus loop	PM1 CPU hand shake	PM1 HAC32 fault	PM1 IO Card fault	PM1 PPIO fault	PM1 timer A	Spare
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	Spare	Spare	PM2 EE check sum	Spare	PM2 pointers memory	PM2 PDW FIFO	Spare	PM2 BI DMA	PM2 interupts	PM2 AC Bus loop	PM2 CPU hand shake	PM2 HAC32 fault	PM2 IO Card fault	PM2 PPIO fault	PM2 timer A	Spare
	☐	☐	☐	☐	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐	☐

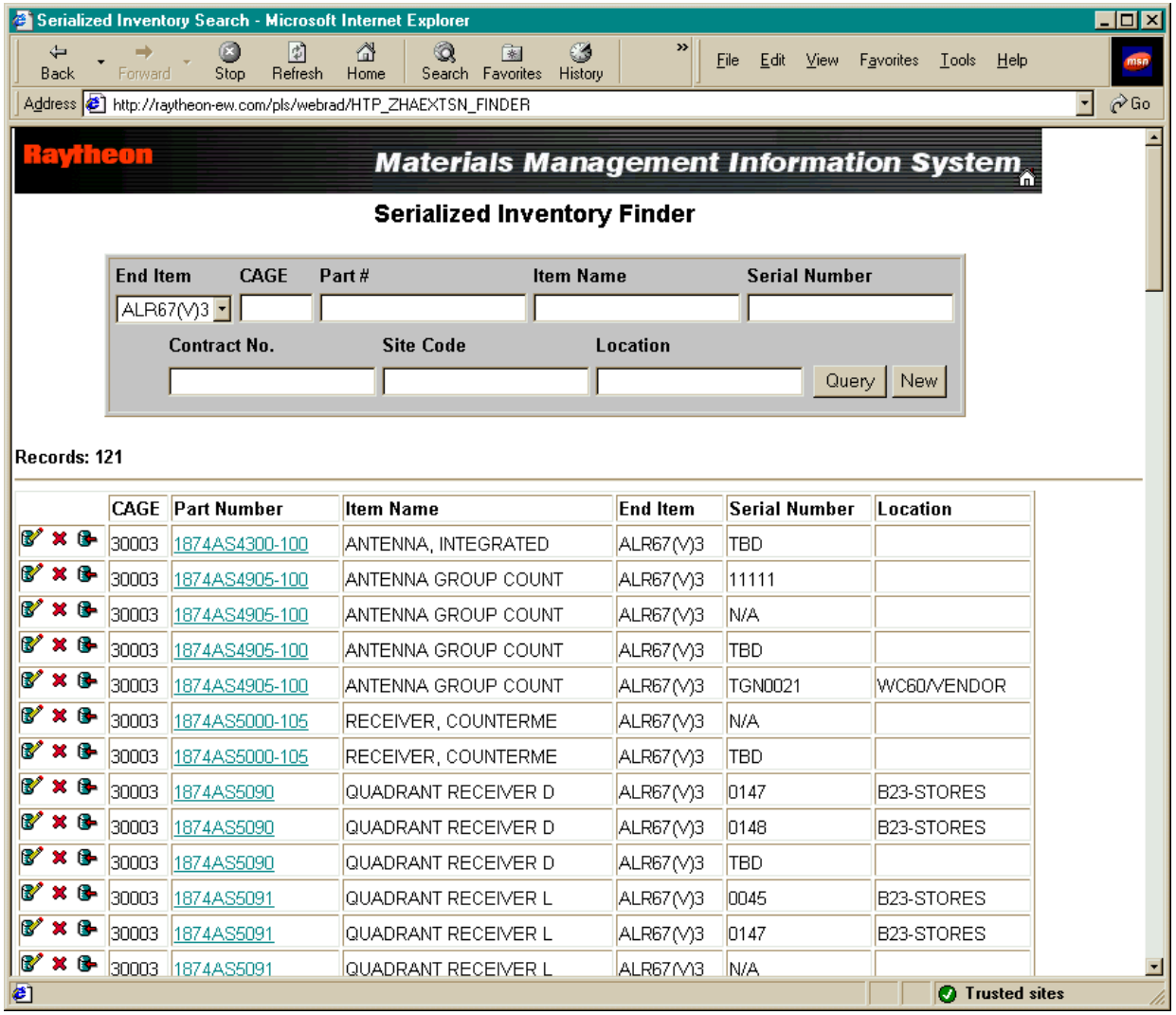
	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
BITPAGE 4	IOM AC Bus	wall clock	T&C	CI interface	EW/AV mux bux	QR/IAD interface	audio tone generator	discrete outputs	HARM data bus	HARM video	HARM tracker	Spare	Spare	Spare	Spare	degraded mode
	☐	☐	☐	☐	☐	☐	☑	☐	☐	☐	☐					☐
	15	14	13	12	11	10	9	8	7	6	5	4	3	2	1	0
	CPU heart beat	AC Bus fail	CP over temp	Look History wrap	PDW over flow	Spare	Spare	Watch Dog timer	LBIA port video CP	LBIA stbd video CP	LBIA port video CR	LBIA stbd video CR	LBIA BIT switch	LBIA Low RF DET CR	LBIA no defects	CI fail
	☐	☐	☐	☐	☐			☐	☐	☐	☑	☐	☐	☐	☐	☐

	31	30	29	28	27	26	25	24	23	22	21	20	19	18	17	16
	TOA clock CP	TOA clock CR	Spare	CR loop	CH freq discrim Q2	CH freq discrim Q2	CH freq discrim Q1	SH log amp	CR RF atten	Spare	CH detect thrshld	SH detect thrshld	CH pulse width sector 2	CH pulse width sector 1	SH gain control	CR over temp

Done Trusted sites

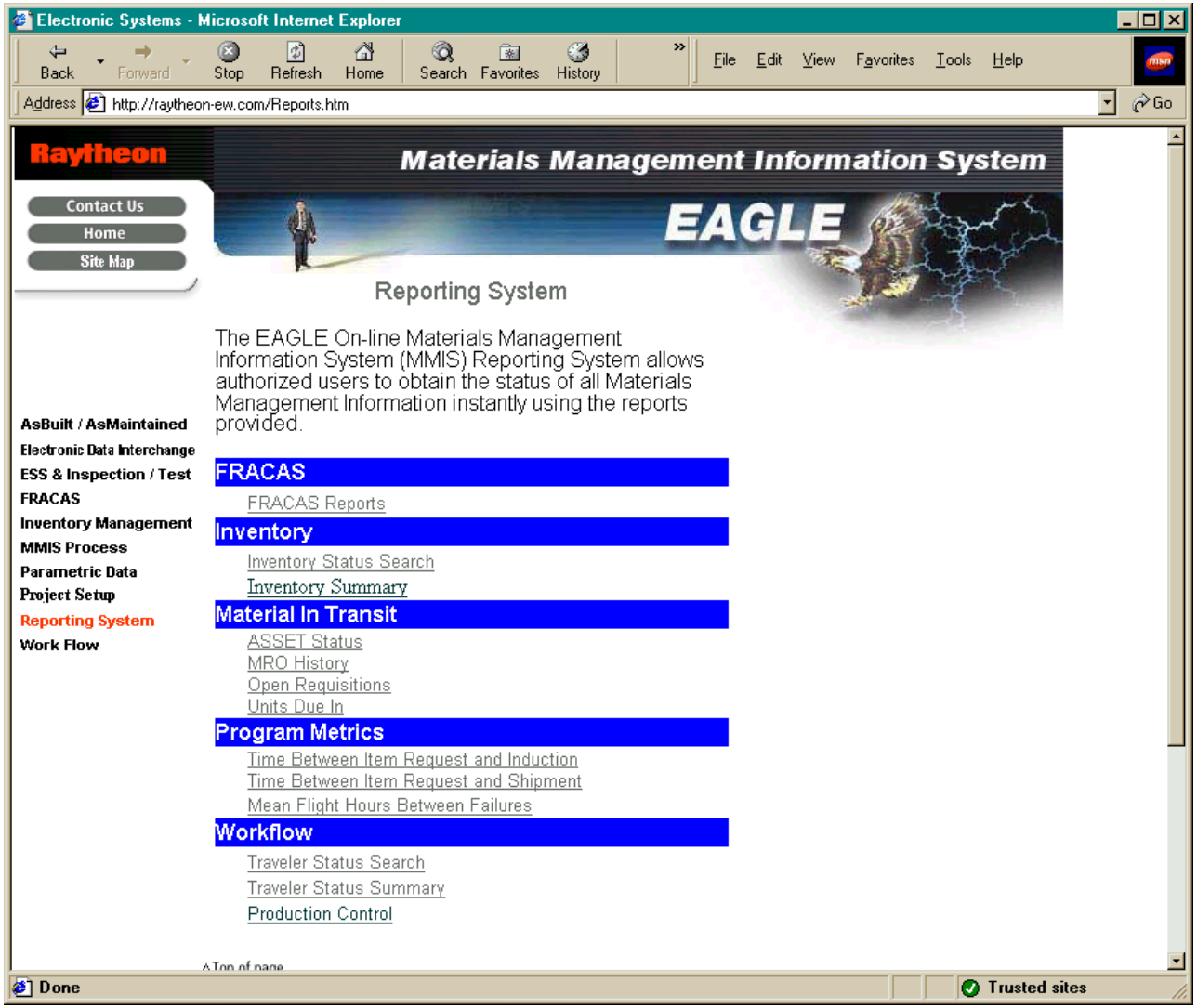
Copyright © 2003 Raytheon Company
All rights reserved

Inventory Status Search

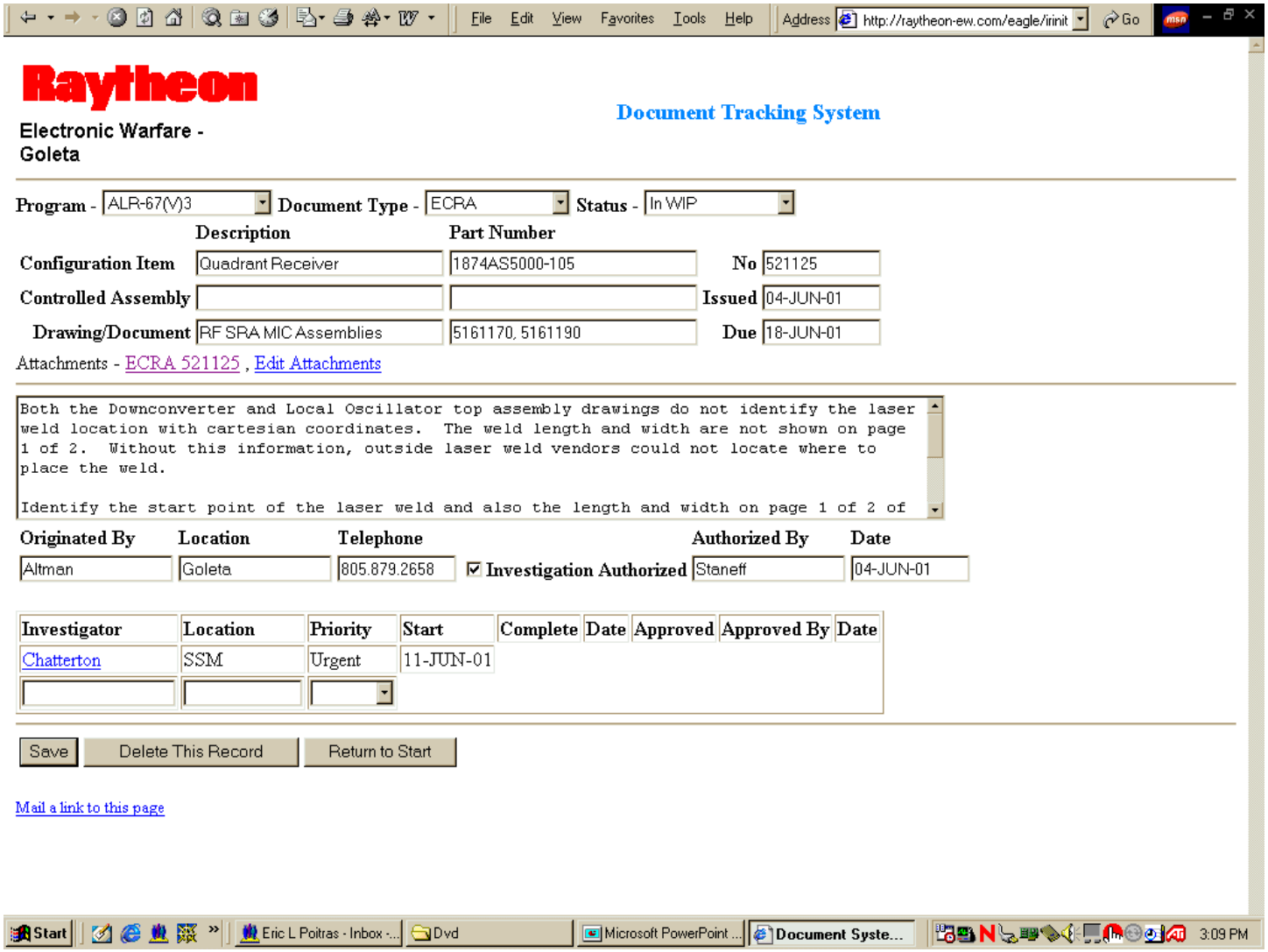

Serialized Inventory Search - Microsoft Internet Explorer
File Edit View Favorites Tools Help
Back Forward Stop Refresh Home Search Favorites History
Address http://raytheon-ew.com/pls/webrad/HTP_ZHAEXTSN_FINDER
Go
Raytheon
Materials Management Information System
Serialized Inventory Finder
End Item
CAGE
Part #
Item Name
Serial Number
ALR67(V)3
Contract No.
Site Code
Location
Query
New
Records: 121
CAGE | Part Number | Item Name | End Item | Serial Number | Location
30003 | 1874AS4300-100 | ANTENNA, INTEGRATED | ALR67(V)3 | TBD |
30003 | 1874AS4905-100 | ANTENNA GROUP COUNT | ALR67(V)3 | 11111 |
30003 | 1874AS4905-100 | ANTENNA GROUP COUNT | ALR67(V)3 | N/A |
30003 | 1874AS4905-100 | ANTENNA GROUP COUNT | ALR67(V)3 | TBD |
30003 | 1874AS4905-100 | ANTENNA GROUP COUNT | ALR67(V)3 | TGN0021 | WC60/VENDOR
30003 | 1874AS5000-105 | RECEIVER, COUNTERME | ALR67(V)3 | N/A |
30003 | 1874AS5000-105 | RECEIVER, COUNTERME | ALR67(V)3 | TBD |
30003 | 1874AS5090 | QUADRANT RECEIVER D | ALR67(V)3 | 0147 | B23-STORES
30003 | 1874AS5090 | QUADRANT RECEIVER D | ALR67(V)3 | 0148 | B23-STORES
30003 | 1874AS5090 | QUADRANT RECEIVER D | ALR67(V)3 | TBD |
30003 | 1874AS5091 | QUADRANT RECEIVER L | ALR67(V)3 | 0045 | B23-STORES
30003 | 1874AS5091 | QUADRANT RECEIVER L | ALR67(V)3 | 0147 | B23-STORES
30003 | 1874AS5091 | QUADRANT RECEIVER L | ALR67(V)3 | N/A |
Trusted sites

Copyright © 2003 Raytheon Company
All rights reserved

On-Line Reporting



Copyright © 2003 Raytheon Company
All rights reserved



Raytheon

Electronic Warfare - Goleta

Document Tracking System

Program - ALR-67(V)3 Document Type - ECRA Status - In WIP

	Description	Part Number		
Configuration Item	Quadrant Receiver	1874AS5000-105	No	521125
Controlled Assembly			Issued	04-JUN-01
Drawing/Document	RF SRA MIC Assemblies	5161170, 5161190	Due	18-JUN-01

Attachments - ECRA 521125 , Edit Attachments

Both the Downconverter and Local Oscillator top assembly drawings do not identify the laser weld location with cartesian coordinates. The weld length and width are not shown on page 1 of 2. Without this information, outside laser weld vendors could not locate where to place the weld.

Identify the start point of the laser weld and also the length and width on page 1 of 2 of

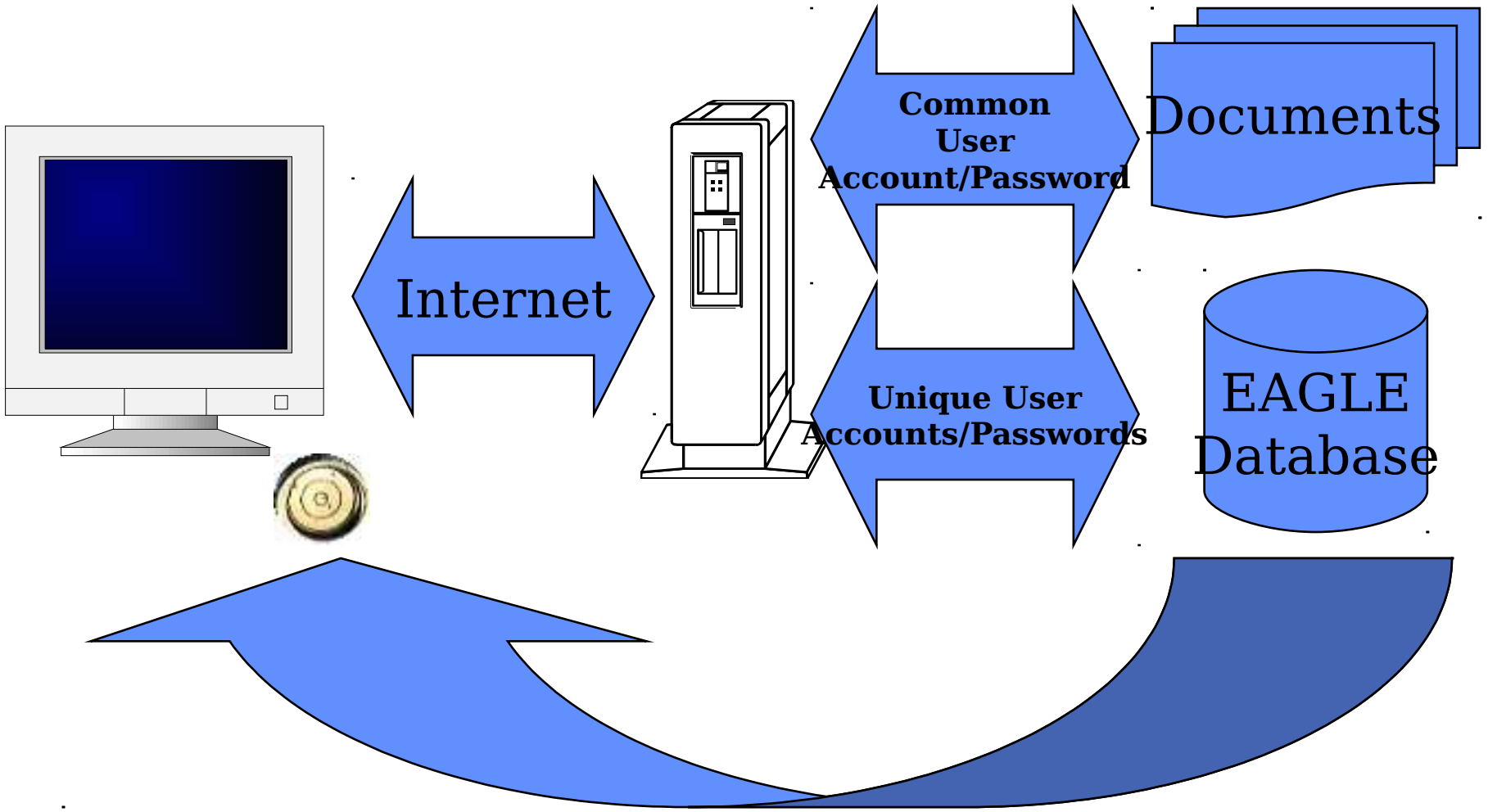
Originated By	Location	Telephone		Authorized By	Date
Altman	Goleta	805.879.2658	☑ Investigation Authorized	Staneff	04-JUN-01

Investigator	Location	Priority	Start	Complete	Date	Approved	Approved By	Date
Chatterton	SSM	Urgent	11-JUN-01					

Save | Delete This Record | Return to Start

Mail a link to this page

Copyright © 2003 Raytheon Company
All rights reserved

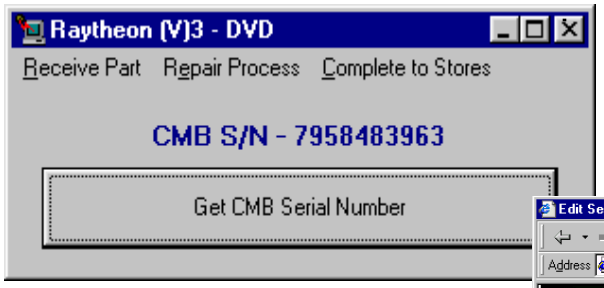


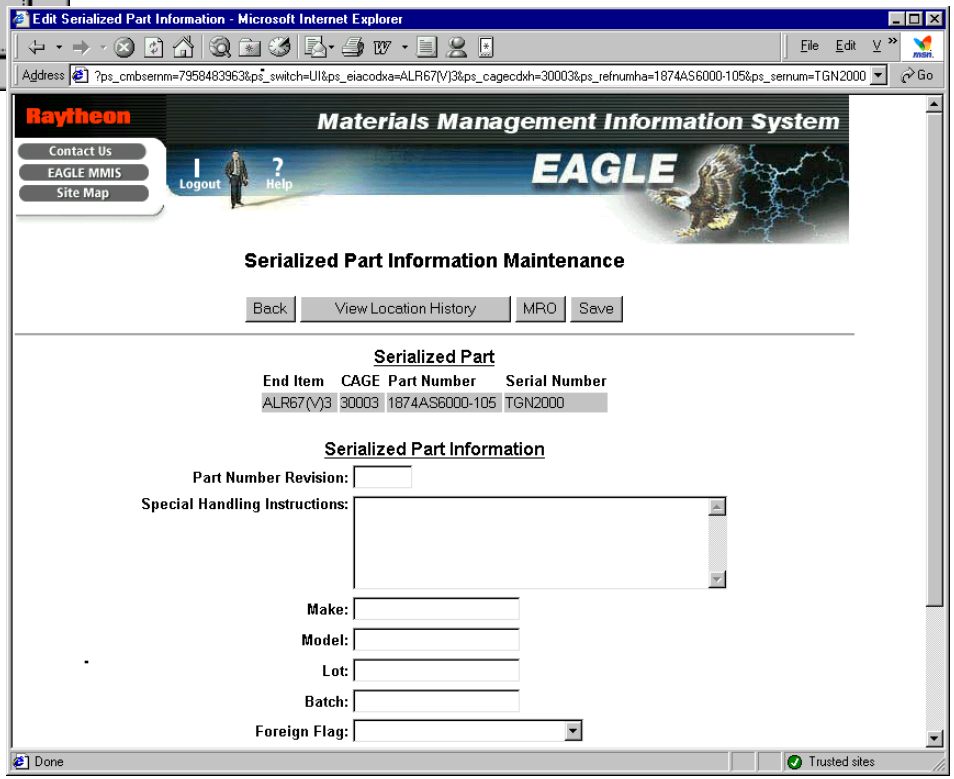
Browser started directly on correct page

Copyright © 2003 Raytheon Company
All rights reserved

MMIS Demonstration
CMB Tracks Inductions

- MMIS Uses CMB to track Hardware
  - Identify Status
  - Locate
  - Find Data

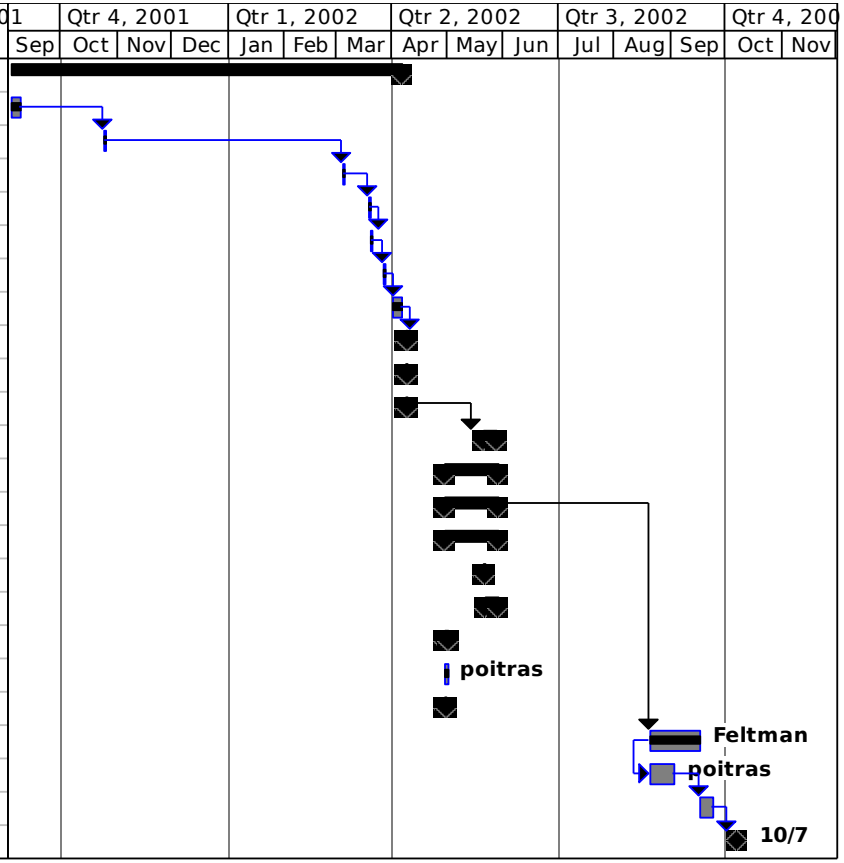




Copyright © 2003 Raytheon Company
All rights reserved

CMB – Project Schedule

ID	Task Name
1	**Develop Concept of Operation**
2	Review Statement of Work
3	Data Coordination Meeting
4	Establish WRA Life Cycle
5	Identify Interface Sequences and Locations
6	Identify Planned Activities for each sequence/location
7	Follow-up Data Coordination Meeting
8	Draft CONOPS document
9	**Prepare Prelimnary ECP Data**
10	**Supporting Documents**
11	**Concept of Operation**
130	**Formulate Detailed Design**
135	**Create Formal Documentation**
136	**Submit Final ECP**
137	**Supporting Documents**
138	**Interface Requirements Specification**
145	**Software Requirements Specification**
150	**Drawings&P/L's**
151	TRS
152	**Assembly Drawings**
158	Implement/Test Detailed Design
159	Obtain CMB's/Button Readers/Software
160	Install CMB's/Button Readers/Software
161	Go Live



Copyright © 2003 Raytheon Company
All rights reserved

CMB – Link Page

Copyright © 2003 Raytheon Company
All rights reserved

Support for Future Initiatives

- Facilitates Mandated Public/Private Partnering (CORE) initiatives
  - Provides a common infrastructure that supports interfaces across multiple business units
    - All users view same data independent of location
    - Data access levels and privileges tailorable by username/role
    - Allows separation of proprietary and sensitive data by linking to internal servers
    - Data availability is assured 24/7
      - mitigates impact of time zones
      - Creates “Portable” Office
  - Can be extended to interface with other off-site business systems
    - Raytheon
      - Forest MS
      - El Segundo CA
    - Subcontractor
      - BAE Lansdale, PA
      - L/M Owego, NY

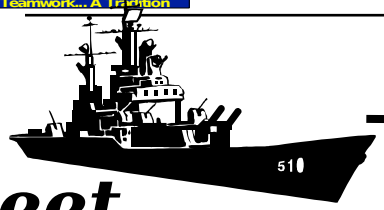
Copyright © 2003 Raytheon Company
All rights reserved

- WEB-CAV – Government System For Tracking Status Of Assets Under Repair At Contractor Sites
  - Cav-contractor Asset Visibility
  - Accessible From The Internet (WEB)
  - Integrated With Other Navy System For Tracking Material Movements
- MMIS – Raytheon System For Tracking All Material Movements And Status Of Assets Under Repair At Raytheon
  - MMIS – Maintenance Management Information System
  - Accessible From The Internet
  - Integrates Several Activities Using “Common” Data And Interfaces
- Integration
  - Since Both Data Sources Report Similar Information To Separate Systems And Users, It Is Desirable To Coordinate The Transfer Of Data Between Both Systems
- Provides A Consistent Body Of Information To Both Government And Contractor Personnel Using Their “Native” Applications

Copyright © 2003 Raytheon Company
All rights reserved

- Item Fails In Fleet
  - O-level Maintainers Requisition Replacement WRA Using Navy Supply System
  - Requisition Forwarded Directly To Raytheon From Fleet Via EDI
  - Retrograde Carcass Delivered Directly To Raytheon
- Raytheon Fills Requisition From Wholesale Spares On Hand
  - Raytheon Reports Delivery Data And “Closes” Original Requisition Via EDI
- Carcass Received At Raytheon
  - Receipt Of Carcass Reported Via EDI
- Carcass Inducted Into WIP At Raytheon
  - Status Of Asset Reported To WEB-CAV
    - In WIP
    - Awaiting Parts
    - Survey/Scrap
  - Carcass Repair Completed
    - Ready For Issue
- RFI Asset Enters Raytheon Wholesale Spares Inventory
  - WEB-CAV Status Complete

Copyright © 2003 Raytheon Company
All rights reserved



Fleet

Req.

Retrograde

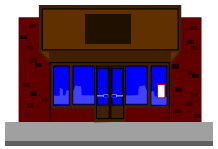
NAVICP

940

945

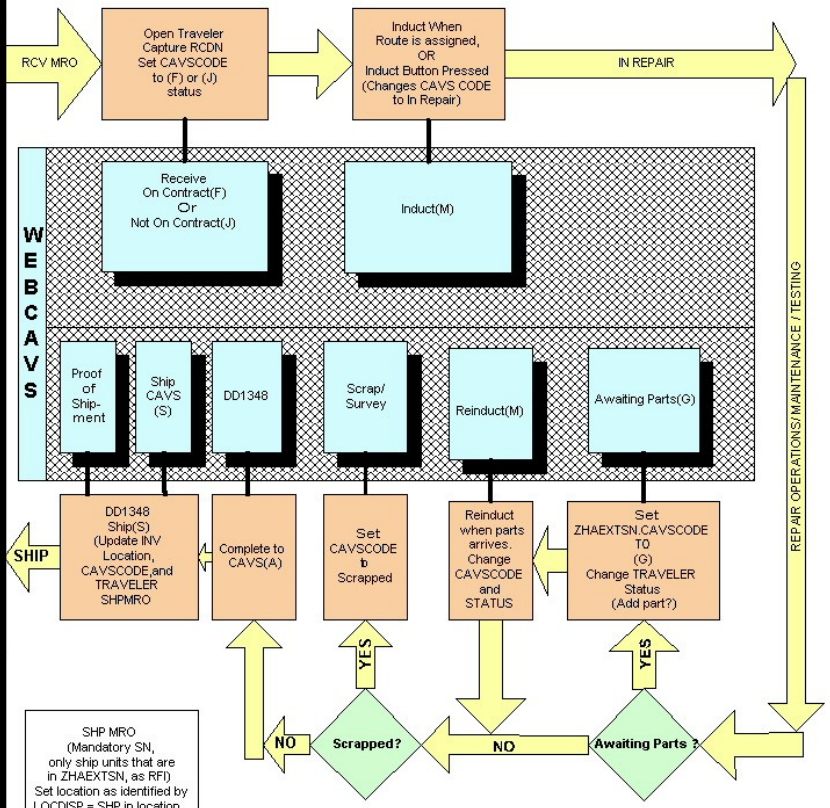
527

RFI WRA



R

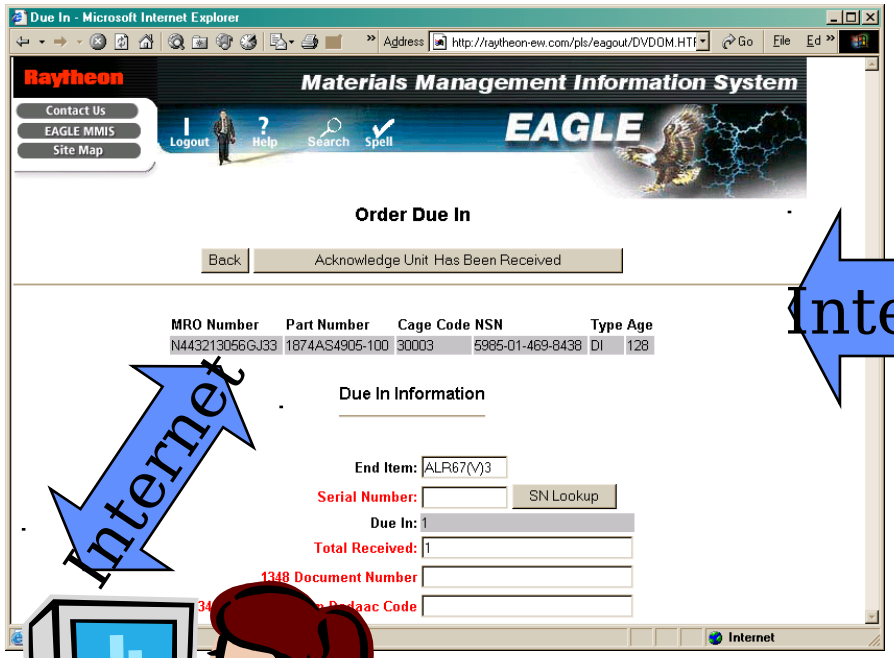
WEBCAVS


RCV MRO
Open Traveler Capture RCDN Set CAVSCODE to (F) or (J) status
Induct When Route is assigned, OR Induct Button Pressed (Changes CAVS CODE to In Repair)
IN REPAIR
Receive On Contract(F) Or Not On Contract(J)
Induct(M)
Proof of Ship-ment
Ship CAVS (S)
DD1348
Scrap/ Survey
Reinduct(M)
Awaiting Parts(G)
REPAIR OPERATIONS/ MAINTENANCE / TESTING
SHIP
DD1348 Ship(S) (Update INV Location, CAVSCODE,and TRAVELER SHPMRO
Complete to CAVS(A)
Set CAVSCODE to Scrapped
Reinduct when parts arrives. Change CAVSCODE and STATUS
Set ZHAEXTSN.CAVSCODE TO (G) Change TRAVELER Status (Add part?)
YES
NO
Scrapped?
Awaiting Parts ?
SHP MRO (Mandatory SN, only ship units that are in ZHAEXTSN, as RFI) Set location as identified by LOCDISP = SHP in location table. Update the traveler.MROSHIP field with the mrodocnum the unit was shipped against

EDI Transactions

WEB-CAV Transactions

Copyright © 2003 Raytheon Company
All rights reserved



CAV Entry Screen v4.1 - Microsoft Internet Explorer
Commercial Asset Visibility
(v4.1b)
DOD WARNING PLEASE READ
Login
ICP:
NAVICP-P (N00383)
User ID:
Password:
Remember: PWDs are now case sensitive!
Enter
Reset
CAV Information Site
* Asterisk indicates a required entry.
Best viewed with Display Property setting of 800 by 600 in 4.75 or above. Also compatible with 5.5 or above.
This server now requires 128-bit encryption. You may need to remove old server certificates or download/install a newer browser.

Internet

Internet

Internet

Raytheon | Government

Copyright © 2003 Raytheon Company
All rights reserved

Why Do We Need It?

- Facilitates Internal Communications/Program Management
  - — E-Mails to Program Personnel when Government MRO is received
  - — Generates EDI Response based on activities performed
  - — Tracks Status of Assets
  - — Generates Management Reports
    - Program Metrics based on EDI/Hardware Turn-around
      - — Receipt of DIFM
      - — Availability of Replacement WRA's
    - MFHBF Metric Based on FRACAS and EDI data
      - — Flight Hours
      - — Chargeable Failures
  - — Allows Common reporting system for all locations
  - — Facilitates Linking to non-Raytheon data sources
    - Shipper Info
    - Government Databases

Copyright © 2003 Raytheon Company
All rights reserved